



Chromatec Refinery gas analyzer by UOP 539 (3TCD)

Introduction

Gas chromatograph equipped with three independent TCD channels, 4 automatic rotary valves and 5 columns intended for quick, easy to use and confident analysis of refinery gases and other gaseous and LPG streams of various composition.

TCD-1: determination of oxygen, nitrogen, C1, C2 hydrocarbons including olefins and acetylene, CO, CO₂, H₂S.

TCD-2: determination of hydrocarbons C3-C5 (including olefins, 1,3-butadiene), C6+ hydrocarbons. Hydrocarbons heavier than 1,3-butadiene are reported as a single peak.

TCD-3: determination of helium and hydrogen. If determination of oxygen is required, argon as a carrier gas shall be used, otherwise nitrogen can be applied as a carrier gas.

Features

- Analysis time: 11 minutes (hydrogen as a carrier gas) or 20 minutes (helium as a carrier gas)
- Isotherm operating mode in the oven guarantees minimum gap between runs.
- Each channel has backflushing which prevents columns from ingress of heavy components and saves run time.
- Sample path tubes are made from nickel which is inert to H₂S-content samples. All the flows are collected into single vent for utilization.
- Heated transfer line is equipped for sampling, it allows sampling heavy samples without distortion of its composition
- Gases from sample path and detectors are collected for disposal
- Minimum concentration to be determined is 0,001% vol., for hydrogen sulfide – 0,02% vol., for neat oxygen (TCD-3 channel) – 0.03% vol. Maximum determined concentration is up to 100% for any component.
- Optional LPG stream vaporizer allows determination LPG streams.



Gas Chromatograph
“Chromatec-Crystal 9000”

Equipment and materials

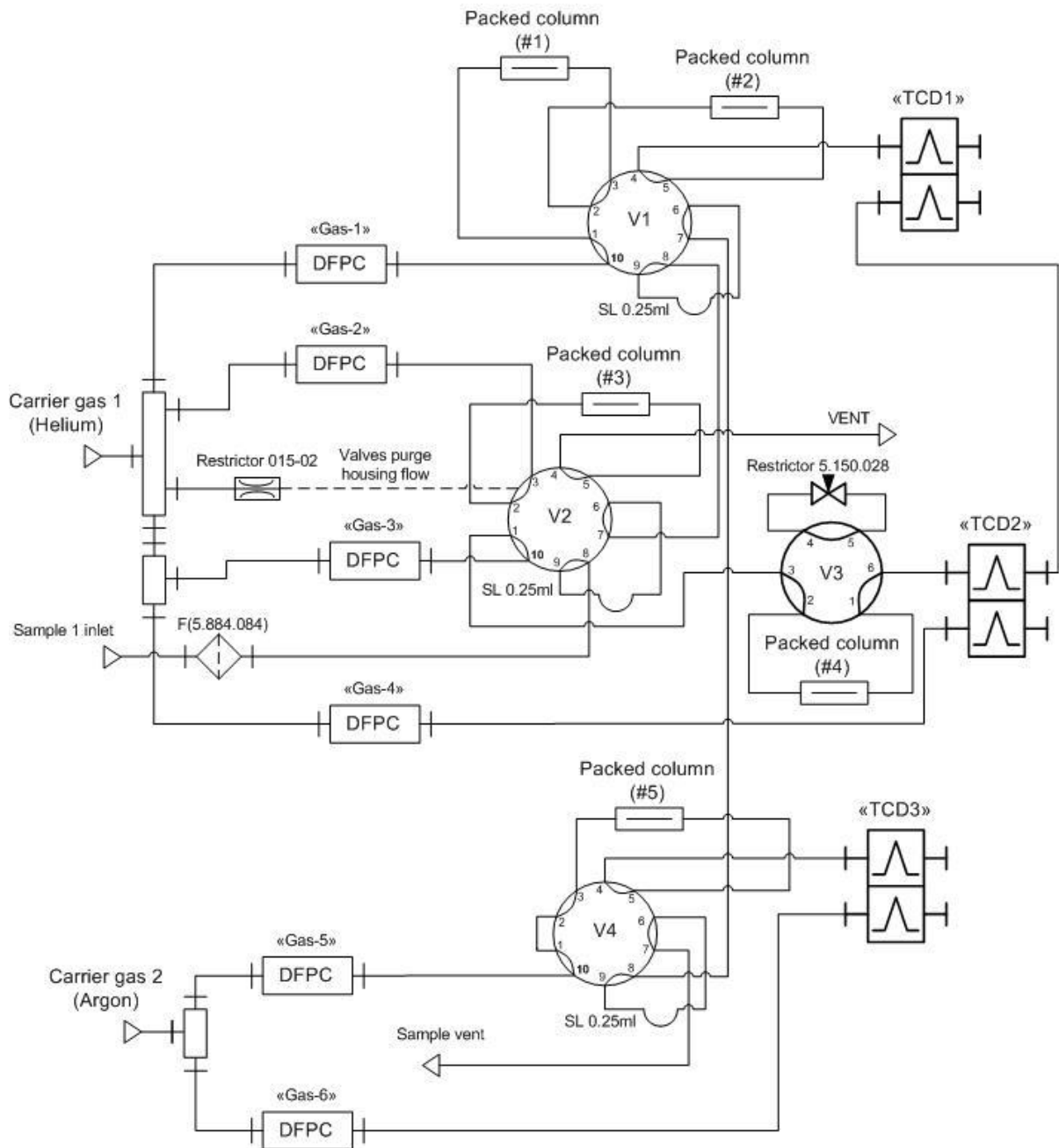
Instrument	Gas chromatograph “Chromatec-Crystal 9000”
Description	TCDx3, Valvesx4, capillary and packed columns. Full electronic control of gas flows.
Channel TCD-1 (Helium or Hydrogen)	10-port valve (automatic, temperature-controlled), 0.25 ml sample loop, Column # 1 and # 2 (Sebaconitrile)
Channel TCD-2 (Helium or Hydrogen)	10-port valve (automatic, temperature-controlled), 0.25 ml sample loop; Column # 3 (Hayesep N), Column # 4 (NaX)
Channel TCD-3 (Argon or Nitrogen)	10-port valve (automatic, temperature-controlled), 0.25 ml sample loop, Column # 5 (NaX)
Options	LPG stream vaporizer (P/N 150-4801) for liquefied gas analysis

Operating Conditions

Chromatograph		
Run Time	11 min (for Hydrogen)	
Channel TCD-1		
Detector temperature:	150 °C	
Carrier gas	Hydrogen	
Gas-1 flow rate	25 ml/min	
Channel TCD-2		
Detector temperature:	150 °C	
Carrier gas	Hydrogen	
Gas-2 flow rate	25 ml/min	
Gas-3 flow rate	10 ml/min	
Gas-4 flow rate (reference through TCD-1 and TCD-2)	25 ml/min	
Channel TCD-3		
Detector temperature:	150 °C	
Carrier gas	Argon	
Gas-5 flow rate	10 ml/min	
Gas-6 flow rate	160 kPa (15ml/min)	
Valves		
Temperature	60 °C	
Apprx. switching time, sec.	V 1: 1; 58 V 2: 1; 360 V 3: 50; 360 V 4: 1, 100	
Column oven		
Isotherm 1:	55 °C	isotherm

Flow diagram

RGA analyzer Chromatec-Crystal 9000 GC (1201C analyzer)



Chromatograms

Using Hydrogen as a carrier gas

